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## **Multi-channel consumer perceptions**

Teltzrow, Maximilian ; Meyer, Bertolt ; Lenz, Hans-Joachim

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## MULTI-CHANNEL CONSUMER PERCEPTIONS<sup>1</sup>

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### ABSTRACT

We present a structural model of consumer trust in a multi-channel retailer. The model was developed on a sample of 1048 consumers who responded to a questionnaire linked to the website of a large German multi-channel retailer. The study identifies perceived privacy concerns as the strongest influence on trust in the e-shop, followed by perceived reputation and perceived size of the offline stores. We further differentiate between respondent groups based on their familiarity with the retailer's e-shop and stores. In general, trust increases over familiarity with the retailer whereas the influence of perceived privacy has the same importance over different levels of familiarity. This research may be of interest to multi-channel retailers, who could use the findings to better align their offline and online marketing strategy. In particular, the results could be used to improve the website design and the delivery options of a multi-channel retailer. Internet-only retailers may consider an increase of marketing efforts in the offline domain.

Keywords: multi-channel retailing, trust, privacy, e-commerce

### 1. Introduction

The distribution of products across multiple sales channels — often referred to as multi-channel retailing — is the norm today. According to a recent survey, multi-channel retailers in the US increased their online market share from 52 % in 1999 to 75 % in 2003 — in contrast to Internet-only retailers, who lost market share correspondingly [Shop.org and Forrester Research 2004]. For some pure Internet retailers, changes towards multi-channel retailing can be observed<sup>2</sup>. The increasing prevalence of multi-channel retailing calls for empirical research on the reasons for consumers' appreciation of that business model. The main research question of this paper is to find out whether the perception of a retailer's physical stores has an influence on consumers' trust in the retailer's e-shop, which may ultimately lead to increased sales. Moreover, this paper aims at quantifying the strength of influence of the three antecedents of consumer trust perceived store size, perceived store reputation and perceived privacy of the e-shop.

### 2. Related Work

A number of surveys suggest that the Internet has a distinct influence on offline sales. In a series of studies conducted by the research consultancy Forrester, retailers claimed that about 24 % of their offline sales in 2003 were influenced by the Web, which is up from 15 % in 2002 [Shop.org and Forrester Research 2004]. A further study estimates that about half of the 60 million consumers in Europe with an Internet connection bought products offline after having investigated prices and details online [Markillie 2004]. A study by Doyle et al. [2003] analyzed the influence of store perception on online sales. 64.7 % of Internet users in 2002 claimed to sometimes or often look at

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<sup>2</sup> The largest e-retailer Amazon.com, for example, features products and services from merchants with physical retail stores since 2002, e.g. Borders (04/02), Circuit City (08/01), Toys R Us.

traditional retail stores and then buy online – up from 50.3 percent in 2001. The surveys indicate that there are distinct cross-channel effects between online and offline retailing. Theoretical contributions discuss multi-channel retailing and demand further empirical work to analyze how the use of multiple channels affect a firm and its customers [Gallaughier 2002, Goersch 2003, Gulati and Garino 2000, Steinfield 2002, Stone, Hobbs and Khaleeli 2002].

Numerous empirical studies suggest trust as one of the most decisive antecedents of consumers' purchase intentions at Internet-only retailers [Grabner-Kräuter and Kaluscha 2003]. We refer to trust as "individual-level internalization of norms of reciprocity, which facilitates collective action by allowing people to take risks and to trust that fellow citizens will not take advantage of them" [Grabner-Kräuter and Kaluscha 2003, p. 672]. Using multivariate models, the studies suggest how the perception of certain variables influences consumers' trust and willingness to buy at Internet-only retailers. However, only very few of these studies explore antecedents of trust in a multi-channel scenario. Stewart [2003] used experimental analyses to measure how users react to a picture of a physical store shown on a website. She introduced the antecedents perceived interaction and perceived business tie and found evidence that people transfer trust from the traditional shopping channel to a Web-based organization. Milliman and Fugate [1988] also found that trust may be transferred from different kinds of sources (e.g. from an organization to an individual salesman).

The literature review indicates that more detailed and actionable antecedents of trust supporting consumers' trust transfer from physical stores to the Internet are required. Therefore, well-known studies exploring antecedents and consequences of consumer trust in an Internet-only context have been analyzed in order to find possible antecedents that could be tested in the multi-channel domain.

Jarvenpaa, Tractinsky and Vitale [2000] developed an Internet trust model that tested the influence of the two independent variables perceived size and perceived reputation on customers' evaluation of trust in a website. The study was validated by Heijden, Verhagen and Creemers [2001]; findings from an earlier cross-cultural study by Jarvenpaa [1999] also supported this notion. Jarvenpaa concluded from her findings that perceived reputation had a much stronger effect on trust as perceived size. Moreover, the model suggested that trust has a direct influence on attitude and risk, which again have an influence on willingness to buy. Jarvenpaa, Tractinsky and Vitale suggest that the effect of perceived size and reputation on consumer trust should be tested in a multi-channel context. Beside the conclusions outlined above, their results also indicated that risk perception - defined as a functional or psychosocial risk a consumer feels he/she is taking when purchasing a product - and trust are in inverse proportional correlation to each other.

Chellappa [2001] extended the model of Jarvenpaa et al. and proposed that in addition to perceived reputation, consumers' perception of privacy and security influence trust in online transactions. These hypotheses received significant support in an empirical evaluation. Further aspects of privacy and its influence on trust at Internet-only retailers have been tested by Belanger, Hiller, and Smith [2002]. Recent work has identified privacy as one of the main requirements for successful e-commerce [Ackerman, Cranor and Reagle 1999, Cranor, Reagle and Ackerman 1999, Culnan and Bies 2003, Tang and Xing 2001].

We build our work on these studies and analyze the perception of trust in a multi-channel context. Moreover, we test our model on different subsets of visitors from a multi-channel retail site, who differed in their familiarity with the company in terms of previous visits and/or purchases to either store or site. Familiarity also has been used as a predictor of trust in empirical studies [Bhattacharjee 2002, Gefen 2000, Luhmann 1988].

### 3. Hypotheses

From the described models for Internet-only retailers, we used the repeatedly cross-validated antecedents of trust, perceived reputation and perceived size as suggested by Jarvenpaa, Tractinsky and Vitale [2000] to analyze effects on trust and willingness to buy in a multi-channel setting. In contrast to the model by Jarvenpaa dealing with Internet-only retailers, our research goal aims at finding out how perceived reputation and size of physical stores influence trust in an e-shop. Our second research goal focuses on the impact of privacy perception of the e-shop on trust as tested by Chellappa [2001]. Thus, we extend the model by Jarvenpaa, Tractinsky and Vitale [2000] by transferring it to the multi-channel domain and by including the antecedent of trust perceived privacy by Chellappa [2001]. This allows us to analyze the strengths of the relationships when the three antecedents of trust perceived reputation of stores, size of stores and perceived privacy are measured simultaneously.

We will briefly introduce the adapted theoretical concepts from the literature [Chellappa 2001, Heijden, Verhagen and Creemers 2001, Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000] and explain our modifications. For a more elaborate discussion of the underlying theory we refer to the original publications.

Jarvenpaa and colleagues [2000] use the concept of trust in the sense of beliefs about trust-relevant characteristics of the Internet merchant. In two empirical studies they found support for a significant influence of

perceived size on trust at Internet-only retailers. According to Doney and Cannon [1997], size also turned out to be a significant signal of trust in traditional buyer-seller relationships. Large companies indicate existing expertise and resources, which may encourage trust. A large store network indicates continuity as stores may not instantly disappear [Goersch 2003]. In a multi-channel context, we assume that the consumer perception of a retailer's physical store presence may also have a positive influence on the perception of consumer trust in the same merchant's e-store. Thus, we hypothesize:

H1: A consumer's trust in an Internet shop is positively related to the perceived size of its physical store network.

Reputation is defined as the extent to which buyers believe a company is honest and concerned about its customers [Ganesan 1994]. Consumers may have more trust in a retailer with high reputation because a trustworthy retailer is less likely to jeopardize reputational assets [Jarvenpaa, Tractinsky and Vitale 2000]. Several empirical studies support the hypothesis that the reputation of an e-shop has a strong influence on consumer trust in that shop [De Ruyter, Wetzels and Kleijnen 2001, Heijden, Verhagen and Creemers 2001, Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000]. A study of traditional buyer-seller relationships also provided support that reputation is an important antecedent of trust [Doney and Cannon 1997]. We assume that the effects observed for a single sales channel may also prove true for the influence of perceived reputation of physical stores on trust in the same retailer's e-shop.

H2: A consumer's trust in an Internet shop is positively related to the perceived reputation of its physical store network.

Concerns of online privacy have increased considerably and are a major impediment to e-commerce [Tang and Xing 2001]. Consumer privacy concerns are particularly elevated on the Internet. A measurement scale for perceived privacy towards an e-shop has been suggested by Chellappa [2001] where privacy has been described as the anticipation of how data is collected and used by a marketer. The author also found empirical support that perceived privacy towards an e-shop is significantly related to consumer trust. We are interested in replicating this effect in a multi-channel setting.

H3: A consumer's trust in an e-shop of a multi-channel retailer is positively related to the perceived privacy at the e-shop.

Trust is closely related to risk [Hawes, Mast and Swan 1989]. Jarvenpaa et al. [2000] refer to risk perception as the "trustor's belief about likelihoods of gains and losses" (p. 49). The hypothesis has been confirmed that the more people trust an e-shop, the lower the perceived risk perception [Heijden, Verhagen and Creemers 2001, Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000]. We also test this hypothesis in our model:

H4: Consumers' trust in an e-shop of a multi-channel retailer negatively influences the perceived risk at an e-shop of a multi-channel retailer.

The theory of planned behavior [Ajzen 1991] suggests that a consumer is more willing to buy from an Internet store which is perceived as low risk. The trust-oriented model by Jarvenpaa et al. [2000] suggests that consumers' willingness to buy is influenced by perceived risk and attitude towards an e-shop. In the studies of Bhattacharjee [2002] and Gefen [2000], a direct influence between trust and willingness to buy has been suggested. Gefen, Srinivasan Rao, and Tractinsky [2003] summarize related work focusing on the relationship between trust, risk and willingness to buy. They come to the conclusion that e-commerce researchers overwhelmingly subscribe to the mediating role of risk in the relationship between trust and behavior [Blair and Stout 2000, Cheung and Lee 2000, Limerick and Cunningham 1993, Morgan and Hunt 1994, Noorderhaven 1996, Stewart 1999]. In this way, we base our model on this established relationship in an Internet-only context and state:

H5: The lower the consumer's perceived risk associated with buying from an e-shop of a multi-channel retailer, the more favorable are the consumer's purchase intentions towards shopping at that e-shop.

It should be noted that although only hypotheses one and two directly seek to analyze connections between different channels in multi-channel retailing environments, hypotheses three through five are also specific to multi-channel retailing because they explicitly target established connections between features in multi-channel environments. The interrelations between the latent variables have so far been only established for environments with only one channel. The hypotheses are summarized in Figure 1.

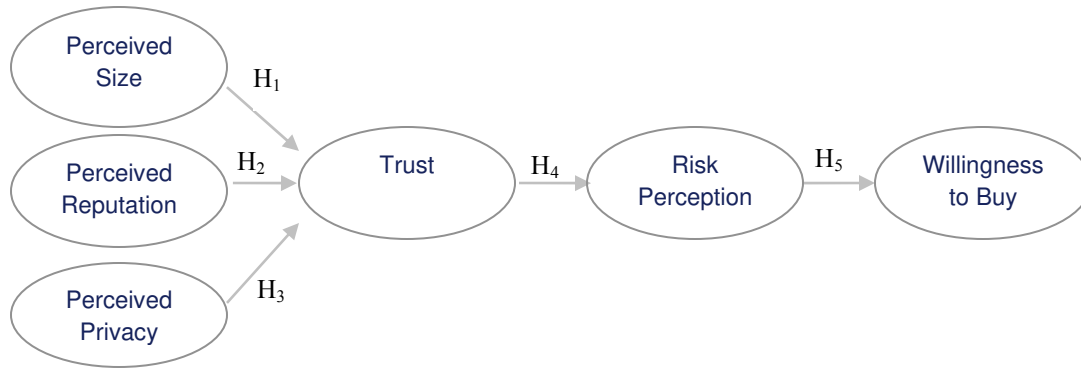


Figure 1: Overview of hypotheses

#### 4. Methodology

##### 4.1 The retailer

The above hypotheses are tested using a survey of visitors of a large German multi-channel retail website. The company's retail site considers itself the first fully integrated multi-channel shop in Europe. The retailer operates an e-shop and a network of more than 6000 stores in over 10 European countries. The company was founded in 1973 and the e-shop launched in 1999. It offers more than 10,000 consumer electronics products both online and offline. The product assortment appeals to a variety of consumer typologies including bargain shoppers and quality-oriented high-end buyers.

About 300,000 visitors per month with an average of ten page impressions per visit access the site. The general conversion rate (proportion of visits that end with a purchase) of the multi-channel site is less than the average of US retailers where conversion is 4.9 % among the top 100 retailers in 2005. Conversion on multi-channel sites tends to be lower because visitors are often researching purchases to be made offline [Yen 2005]. The retail site uses an online privacy statement that can be accessed through a link on each page of the site which adheres to the legal regulations concerning the processing and use of electronic data in the European Union [EU 2002].

A questionnaire was accessible via a rotating banner on the retail site. The banner announcing the survey offered an optional raffle and was kept online for 5 months from 1st of March 2004 to end of July 2004. All participants who left their e-mail address participated in the raffle of three digital cameras.

##### 4.2 Questionnaire

The answers to the online questionnaire were measured using a Likert scale ranging from 1 to 5, with 1 indicating an attribute was "very weak / unlikely" and 5 "very strong / likely" [Likert 1932]. The questionnaire was in German and consisted of the items summarized in Table I as well as questions about demographics and previous visits to the shop and the stores. Demographic information included age, gender, Internet experience, and e-mail address.

Scales were constructed on the basis of past literature as shown in Table I. For each item of the constructs perceived size and perceived reputation, the term "this website" was replaced with "this retailer's physical store network" to emphasize the offline context. For the remaining items, we used the term "this e-shop" to draw a clear distinction between online and offline presence. The following modifications of the scale suggested by Jarvenpaa [Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000] were adapted from Heijden et al. [2001]: For the construct willingness to buy, we changed the time horizons "three months" and "the next year" to the broader terms "short term" and "the longer term". For each construct we used only three items to keep the questionnaire as short as possible, which was a requirement from the multi-channel retailer. We also modified two items of the risk scale suggested by Jarvenpaa [Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000] to meet German language subtleties. The item "How would you characterize the decision to buy a product through this website?" with answers ranging from "a very negative situation" to "a very positive situation" was changed into "How would you characterize the risk to purchase at this e-shop?" with a scale ranging from "very low risk" to "very high risk". We also introduced a new item to measure consumer perceptions of the store network size: "This retailer's stores are spread all over the country". Five members of the faculty staff and ten students reviewed a preliminary version of the measurement instrument with respect to precision and clearness. In a pre-test with 30 participants (unequal to those who screened the instrument), the scales showed satisfactory results for Cronbach's Alpha [Cronbach 1951] (perceived size = .75, perceived reputation = .85, perceived privacy = .95, willingness to buy = .71, trust = .80, risk perception = .74).

##### 4.3 Pre-processing and Respondent's Demographics

Records of 266 respondents were eliminated from a total of 1314 due to missing data (205), duplicate e-mail addresses (41 entries) or text fields that belonged apparently to the same participant (20). 1048 complete answer sets are used for modeling and log-files were checked for duplicate IP-addresses/timestamps in order to rule out possible multiple entries from the same person.

Table 1: Sample demographics and Internet experience

Age	Male	Female	Internet experience	Male	Female
< 30	223	110	< 1 year	30	20
30 - 50	437	143	1 – 3 years	115	67
> 50	103	22	3 – 5 years	199	93
no answer	7	3	> 5 years	418	96
			no answer	8	2

The user demographics of our sample is predominantly male and between 30-50 years old. Thus, it reflects the gender gap that still predominates Internet usage in Europe [Hupprich and Fan 2004]. Most of the users in our sample are experienced in using the Internet (compare table 1). Moreover, participants were asked about their channel experience prior to their actual visit. For each of the four incidents "purchased at e-shop", "purchased at store", "visited e-shop" and "visited store", participants were asked to answer if and how often they had visited the e-shop or store and if and how often they had purchased in the e-shop or in-store. The answers are depicted in Table 2. Section 5.3 will further differentiate these groups

Table 2: Prior experiences with the retailer's e-shop and stores

	e-shop	store	purchase at e-shop	purchase at store
no previous visit / purchase	300	337	818	425
1-2 times	243	274	168	320
3-5 times	101	111	26	85
>5 times	388	315	20	200
no answer	16	11	16	18
Total	1048	1048	1048	1048

A total of 605 participants claimed to have purchased at least once. Since we did not state a time frame for this question, it must be noted that these purchases may have taken place well in the past, as the shop network was established in 1973. Thus, it is not surprising that participants had more experience purchasing from the physical store than at the e-shop (established in 1999), which was specified by 214 participants. Moreover, 200 claimed that they had purchased more than five times at a retail store. In contrast, the number of people who visited the store at least once was almost equal to the number of visitors who visited the e-shop at least once. Unfortunately, the data was gathered in such a way that cross tabulation, i.e. an analysis of conversion rates from previous visits to later purchases is not possible. However, these numbers hint at the importance of physical stores to the online audience in a multi-channel setting.

#### 4.4 Factor Analysis and Structural Modeling

We use cross-validation and divided the sample of 1048 records into two sub-samples  $n_1=n_2=524$  using simple random sampling. A confirmatory factor analysis (oblimin rotation) [Jennrich and Sampson 1966] is performed on sample 1. This analysis was intended to confirm the hypothesized scales in terms of the discovery of six factors that each make up the employed scales.

If a plausible factor structure could be identified, it would be desirable to quantify the effect of perceived size, reputation of stores, and privacy onto trust, willingness to buy, and risk perception. Factors are latent (not directly observable) variables. Linear structural modeling is used here as it allows the simultaneous mapping of relationships between several latent and non-observable variables within a single multi-equation model [Jöreskog and Sörbom 1979, 1996a].

The variables of the questionnaire have ordinal scales. Model specification and parameter estimation is based on SIMPLIS [Jöreskog and Sörbom 1996a] and LISREL 8.54 [Jöreskog and Sörbom 2003], and uses only sample 1

units. The model parameters are estimated by weighted least squares algorithm [Jöreskog and Sörbom 1996a]. Model structures were learned and the parameter estimated in an explorative and iteratively way. The model is then tested on sample 2 in order to guarantee unbiased measures of goodness of fit.

## 5. Results

Firstly, we present a factor analysis, secondly evidences derived from the model, and finally we close with remarks on privacy, trust and familiarity of respondents.

### 5.1 Factor Analysis

The factor analysis included all items from Table I of the appendix. The "Eigenvalue > 1" criterion lead to an initial five-factor model. However, a strong evident decline in the scree-plot after the sixth factor demanded a rotation with six factors. The extraction with principal component analysis (PCA), and oblimin rotation ( $\delta = 0^\circ$ ) resulted in 74 % explained variance. The first factor has a relatively high fraction of the overall variance (33,9 %). After rotation, all factors had Eigenvalues above 2.

Four factors displayed medium intercorrelations (see Table 3), which underlines the necessity of an oblimin rotation. The pattern matrix of the rotated solution can be found in Table II of the appendix.

The factor loadings can be found in Table I of the appendix. All factors include three items each with high factor loading above .6, except for the last factor (trust), cf. -.52, -.58 and -.76. Each factor contains three items that comprise one scale of the questionnaire (compare Table I in the appendix). Thus, the confirmatory factor analysis supports the hypothesized scales from the questionnaire and allows testing of models of causal influence between factors. Accordingly, the reliability (cronbach's alpha) of the scales is satisfactory (.72 for willingness to buy, .73 for perceived size, .86 for perceived reputation, .81 for trust, .95 for perceived privacy and .72 for risk perception). The medium factor correlations between the factors perceived reputation and perceived privacy, perceived reputation and perceived size, perceived reputation and risk perception, and perceived reputation and trust already indicate that influences between factors exist.

Table 3: Factor inter-correlation matrix

	Perceived Reputation (PR)	Willingness to Buy (WTB)	Perceived Privacy (PRI)	Perceived Size (PS)	Risk Perception (RP)	Trust (TR)
PR	1.00	.02	.31	.42	.37	-.39
WTB	.02	1.00	-.08	.07	.12	-.06
PRI	.31	-.08	1.00	.25	.20	-.27
PS	.42	.07	.25	1.00	.19	-.25
RP	.37	.12	.20	.19	1.00	-.19
TR	-.39	-.06	-.27	-.25	-.19	1.00

### 5.2 Linear Structural Models

To test our main five hypotheses, the six factors identified above are inserted into a linear structural model according to Figure 1.

The models were developed with the SIMPLIS command language [Jöreskog and Sörbom 1996a] and LISREL 8.54 [Jöreskog and Sörbom 2003]. Due to the fact that ordinal questionnaire data was used, the weighted least squares algorithm for polychoric correlations was employed, including the asymptotic covariance matrices [Jöreskog and Sörbom 1996a].

However, satisfactory model parameters for the original hypothetical model (compare Figure 1) could not be reached. In the non-fitting model, the path between risk perception and willingness to buy (Hypothesis 5) showed a non-significant t-value ( $r = .10$ ,  $t = 1.77$ ), so the factor willingness to buy was removed from the model. In the resulting second model, the path between Trust und Risk perception did show a highly significant coefficient of .76, but the model did not display satisfactory fit indices ( $RMSEA = .061$ ). Thus, the factor Risk had to be removed as well, and hypotheses four and five do not receive empirical support in our study. In order to test for hypothesis one through three, a third model was set up. The model is the same as in Figure 1 but without the factors risk perception and willingness to buy. The underlying assumption of this model is that the factors perceived size, perceived reputation, and perceived privacy determine trust. This model produced stable parameter estimates and reached acceptable fit indices. The completed model for the first sample with all standard errors, factor loadings, and path coefficients is depicted in Figure 2.

All path coefficients display a significant t-value on the 5% level. Goodness of fit statistics provide a  $\chi^2$  - value of 96.17 with 48 degrees of freedom, leading to a p-value of 0.00005. Since the  $\chi^2$  fit index in linear structural models is highly dependent on the sample size [Byrne 1998] and tends to underestimate the model fit in larger samples, further fit indices are considered for model assessment. The Root Mean Square Error of Approximation (RMSEA) of 0.044 leads to a p-value for Test of Close Fit of .778, which indicates a good model fit. A Goodness-of-Fit Index (GFI) of 0.99 and an Adjusted Goodness-of-Fit Index (AGFI) of 0.99 also hint at a good overall model fit, but since the parsimony indices PNFI and PGFI are less good (.721 and .612 respectively), the model is held to show an overall acceptable fit.

The above measures may be biased since the model is induced from the same sample that delivered the factors in the confirmatory factor analysis. An unbiased test of the model can be achieved by applying it to the second sample of n=524 participants. The model for sample 2 gives a  $\chi^2$  - value of 97.31 with 48 degrees of freedom, leading to a p-value of 0.00003. This RMSEA-value of 0.044 leads to a p-value for Test of Close Fit of .758, a PGFI of .611, a PNFI of .719 and an AGFI of .996. In summary, these measures point out an acceptable model fit with path coefficients in the same range as in the previous model. The relevant path coefficients and fit indices for the two sub-samples as well as for the full sample are summarized in Table 4. All path coefficients in the samples are significant on the 5% level except the coefficient from perceived size to trust in the second sub sample. However, the coefficient is significant in the full sample.

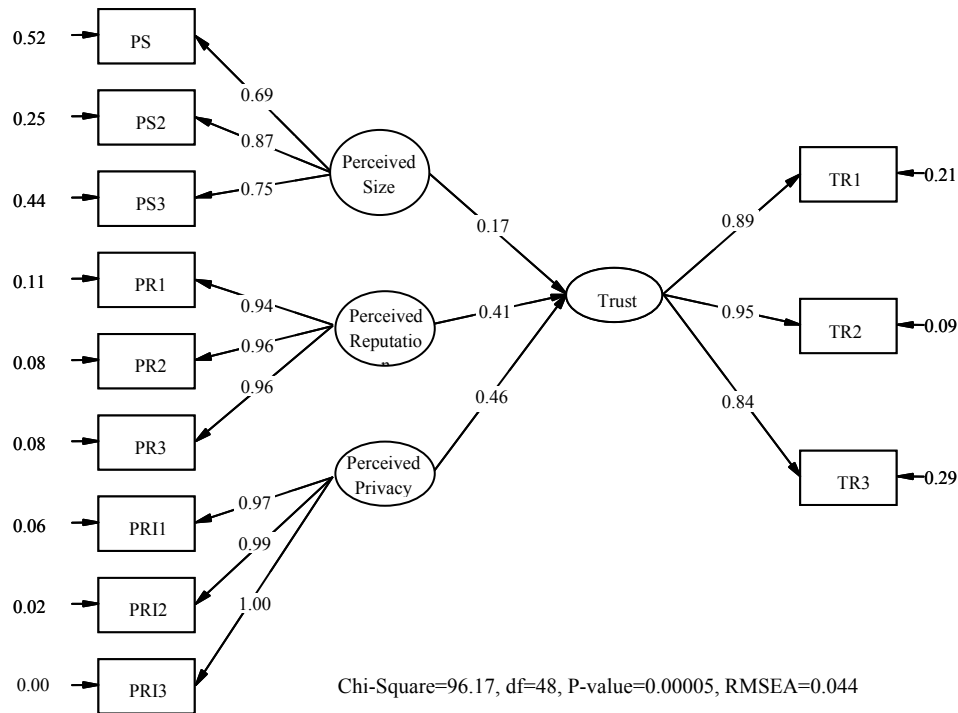


Figure 2: Linear structural model for the influence of perceived size (PS), perceived reputation (PR), perceived privacy (PRI) on trust (TR) for sample 1 (N=524).

Table 4: Overview of relevant path coefficients and fit indices for sub samples and entire sample

Sample	N	Path perceived size → trust	Path perceived reputation → trust	Path perceived privacy → trust	$\chi^2$	df	P	RMSEA	P (close fit)
1st	524	0.17*	0.41*	0.46*	96.17	48	0.00005	0.044	0.778
2nd	524	0.04 <sup>ns</sup>	0.47*	0.47*	97.31	48	0.00003	0.044	0.758
Full	1048	0.11*	0.42*	0.46*	106.80	48	0	0.034	0.999

Note. \* indicates a significant t-value on 5%-level. ns = not significant.



The first hypothesis (a consumer's trust in an Internet shop is positively related to the perceived size of its physical store network) is supported by the significant path between perceived size and trust in the first sub-sample and the overall sample. The second hypothesis (a consumer's trust in an Internet shop is positively related to the perceived reputation of its physical store network) receives strong support from the significant path between perceived reputation and trust in all three samples. In the same way, the third hypothesis (a consumer's trust in an e-shop of a multi-channel retailer is positively related to the perceived privacy at the e-shop) is supported by the significant path between perceived privacy and trust in all three samples. Thus, our results confirm that a consumer's trust in an Internet shop is positively related to the perceived size and perceived reputation of its store network. The influence of perceived online privacy on trust is even stronger than that of perceived reputation and size of the store network.

Hypothesis 4 assuming a negative influence of trust on risk perception and hypothesis 5 assuming an influence of risk perception on willingness to buy have not been confirmed with the conservative methodical approach presented above. Figure 3 summarizes our findings with regard to the original hypotheses (path coefficients from the total sample).

### 5.3 Familiarity Index and Trust

The surveyed data allowed for a more in-depth analysis of the factor influences of perceived size, reputation and privacy on trust. As the survey respondents reported whether or not they previously visited the e-shop and/or the physical store and whether they bought there, it is possible to model sub-groups of the sample, which differed in the degree of familiarity with the retailer. This approach is based on Bhattacharjee's [2002] attempt to model trust in relation to familiarity. Gefen [2000] defines familiarity as an "activity-based cognizance based on previous experience or learning" (p. 727).

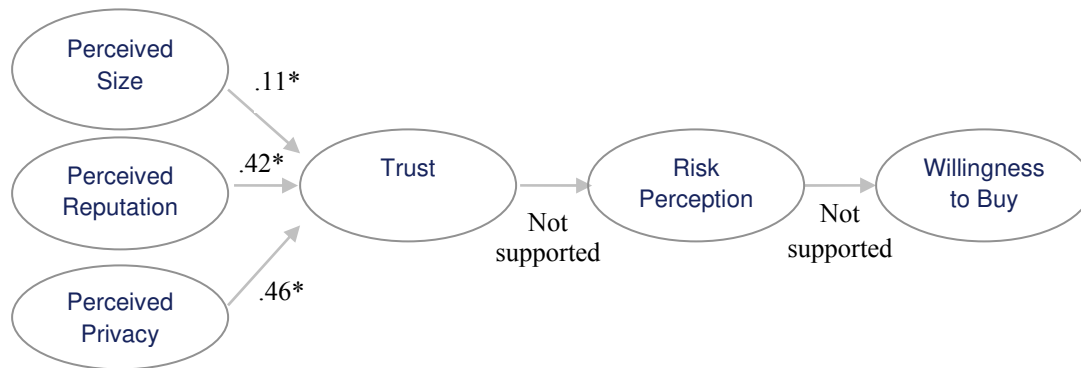


Figure 3: Summary of findings with regard to original hypotheses

The reason for this explorative analysis is to find out whether different levels of familiarity lead to different factor scores in our model. In order to find a measure of familiarity, subgroups were identified that differed in the characteristics of previous visits and/or purchases to either store or site. For each of the nine possible groups, we defined a familiarity index. Our index values are based on the assumption that familiarity increases with the events "visit" and "purchase" at an e-shop and/or store. First, we assumed that users who know both e-shops and stores have a higher familiarity index than users of just one channel because they have the opportunity to experience the retailer on a broader basis. Second, it has been assumed that people who purchased at the retailer have a higher familiarity index than people who just visited store or site. A reason for this assumption is that a purchase is a trust-critical event that requires the users' willingness to engage in a financial transaction and to bear the associated risks.

Therefore, individuals who had previously shopped at both the retailer's site and store receive the highest familiarity index, while subjects with no previous visits to either site or store (first-time visitors) received the lowest index. The assignments of familiarity indices to the groups along with their appropriate group sizes are given in Table 5. The non-dichotomized numbers of previous purchases at and visits to an e-shop or store have not been further considered in the familiarity index because the group sizes would have been too small.

Table 5: Sample subgroups with corresponding sizes  $n$  and familiarity index in brackets.

Store \ Site	No previous visit		Previous visit without purchase		Previous visit with purchase	
No previous visit	157	(1)	128	(2)	26	(4)
Previous visit without purchase	32	(2)	65	(3)	36	(5)
Previous visit with purchase	123	(4)	303	(5)	178	(6)

Three groups of subjects are identified with group size  $N > 153$  (which is the minimum sample size for structural modeling for three items for each of the four constructs [Jöreskog and Sörbom 1996b, p. 171]). These three models are calculated in the same way as the models above. Since the sample sizes for these sub-groups is smaller and we allow a variation of parameters across these nested models, the  $\chi^2$  - value for the subgroups will be lower than in the overall sample, and a significant improvement of  $\chi^2$  in comparison with an overall model would indicate that the construct under supervision has an effect on the relationships under consideration [Homburg and Bucerius 2005, p. 104]. This statistic is significant for all three overall  $\chi^2$  - model values (see Table 6), but this is only an explorative indication because the familiarity construct itself is not included in the models, but was used to select sub-samples for the models.

For these three models, the path-coefficients between perceived reputation and trust and between perceived privacy and trust as well as the z-transformed factor score of the dependant variable trust is plotted in Figure 4. The path coefficient from perceived size to trust is not included in the diagram, because it is not significant for the three subgroups.

Table 6: path coefficients and fit indices for the three subgroups with differing familiarity

Subgroup (familiarity index)	N	Path perceived size $\rightarrow$ trust	Path perceived reputation $\rightarrow$ trust	Path perceived privacy $\rightarrow$ trust	$\chi^2$	df	P	RMSEA	$\chi^2$ Difference
1	157	0.07 <sup>ns</sup>	0.36*	0.61*	11.75	17	0.81	0	95.05*
5	303	0.11 <sup>ns</sup>	0.36*	0.69*	19.83	17	0.28	0.018	86.97*
6	178	0.12 <sup>ns</sup>	0.5*	0.52*	13.9	17	0.67	0	92.90*

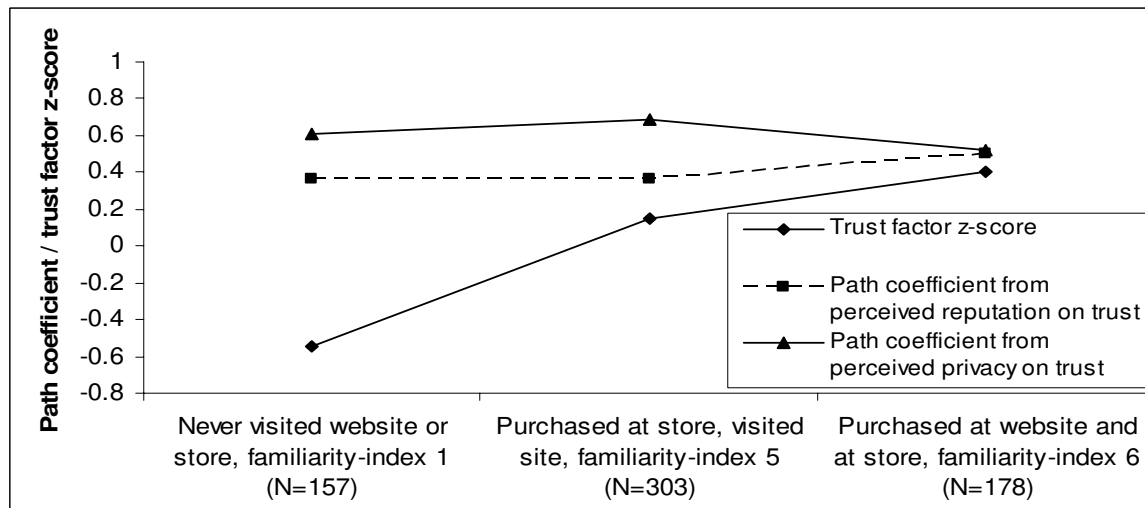


Figure 4: Significant path coefficients and average trust factor scores over different familiarity indexes. The differences of the path coefficients between the groups are not significant.

First of all, the overall factor structure of the three subgroups is identical with the structure of the overall sample: perceived privacy has the strongest influence on trust, followed by perceived reputation and perceived size. Since the influence of perceived size on trust was closer to non-significance in the overall sample, it is not surprising that it did not reach significance in the tested subgroups. The fact that the overall factor structure remains constant

over different subgroups provides further support for the structural model above. However, the fact that consumer trust in an e-store of a multi-channel retailer increases with higher familiarity of the retailer indicates that familiarity of the retailer could be another factor that causally determines trust in the vendor. Since we constructed the familiarity measure ex-post after the survey, due to its nominal scale and due to the fact that it was not part of the original research model, we cannot include it in our structural model. However, an inclusion of the construct in future research might pose a source of further variance explanation of the trust construct. Familiarity seems to be independent of perceived privacy and reputation, as those two factors maintain the same ratio of influence over increasing levels of familiarity. No matter how familiar a customer is with the retailer, the perceived level of privacy determines trust to a stronger extent than the perceived reputation of the retailer. This finding underlines the importance of privacy concerns in multi-channel retailing.

## 6. Discussion and Implications

The results indicate that perceived privacy of the e-shop has the highest influence on trust, followed by perceived reputation of the store network. The variable perceived size of the store network has the smallest influence on trust in our data. This result has been confirmed in two random samples with acceptable model fits. Although these findings indicate that privacy is crucial to successful e-commerce [see also Teltzrow and Kobsa 2004], Kohavi [2001] indicates that less than 0.5 % of all users read privacy policies. Though visitors often do not act according to their privacy attitudes, most are highly concerned about their privacy online [Berendt, Günther and Spiekermann 2005]. As a consequence, retailers should clearly indicate on their websites that consumers' privacy is protected in order to increase consumer trust.

The results also confirm an effect of perceived store reputation on trust in the e-shop. A small effect of perceived store size on trust is also observed. Thus, our study confirms that consumers' perception of physical stores can have a significant cross-channel influence on trust in an e-shop. Jarvenpaa, Tractinsky and Vitale [2000] showed that reputation and size are important antecedents of trust at Internet-only retailers. Her speculation that the presence of physical stores might increase consumers' trust in a seller's Internet store can be supported with our results. It can be assumed that cumulative effects between consumers' perceptions of online and offline reputation and size exist. This could be an explanation as to why consumers prefer multi-channel retailers that now dominate more than two-thirds of the total online market [Shop.org and Forrester Research 2004]. Thus, a strategy to increase trust could be a promotion of trust-building measures between different sales channels. This could include offline advertising of the website or the placement of in-store kiosks, where consumers can order online when products are out of stock. Further studies should explore the observed influence of perceived store size and reputation on trust in the e-shop and whether there are cumulative effects between the perceived reputation and size of the e-shop on trust. Therefore, a larger sample of consumers is required in order to discriminate between three groups of visitors: "familiar with the website only", "familiar with stores only", and "familiar with both channels".

A further analysis of the variables trust, risk perception and willingness to buy might pose an interesting improvement of our study, since the causality between trust, perceived risk, and willingness to buy has not been confirmed in our model. One reason might be that additional constructs such as familiarity have an influence on the willingness to buy in our model. The model by Jarvenpaa, Tractinsky and Vitale et al. [2000] includes the construct attitude, which was left out in our analysis because the retailer asked to keep the questionnaire as short as possible. A relationship between trust and marketing success is well-known in traditional marketing theory [Berry 1995, Morgan and Hunt 1994]. Further work should test if there are important mediating factors between trust and willingness to buy. For example, Garbarino and Johnson [1999] found that a model including satisfaction as a mediating construct between trust and commitment significantly improves the model fit compared to a model suggesting a direct influence of trust on intentions.

Subgroup analysis reveals that trust increases proportional to familiarity with the retailer. The familiarity index was directly derived from the respondents' previous visits and purchases at the e-shop and stores. This supports the findings of [2002] and Gefen [2000], who demonstrated that familiarity is a predictor of trust in an e-shop. It is particularly noticeable that regardless of familiarity, the perceived privacy is the factor that influences trust to the strongest extent. Thus, if a retailer desires to direct 'classic' store customers to the Internet-based retailing channel, this retailer should place considerable effort on privacy issues.

All in all, the adherence of privacy seems to be the key in creating trust in first-time customers and in customers previously unfamiliar with Internet retailing.

## 7. Limitations and Further Work

Participants in this study were online consumers. Thus, the sample differs from many other empirical studies that primarily use students as a sample of online consumer population. A limit of external validity within our sample

may have occurred through the self-selection of online participants. However, the use of a rotating banner added randomness to the selection of participants: Only about every sixth visitor saw the banner on the retailer's home page. Moreover, we explicitly asked participants to provide only honest answers.

The results of Jarvenpaa, Tractinsky and Vitale [2000] suggest that perceived size and reputation may influence trust differently depending on the type of products offered, which has not been further considered in this study. The product sector of consumer electronics tends to be highly suitable for multi-channel retailing [Omwando 2002]. It could be that the observed effects are less significant for less Internet-suitable product portfolios. Levin, Levin and Heath [2003] have found that consumers' preferences for online and offline services differ for different products at different stages of the shopping experience. The analysis of different product portfolios and their impact on the path coefficients in a multi-channel context should be analyzed in further work. Moreover, it would be interesting to further research if the higher level of trust in multi-channel retailers may justify a higher pricing strategy as discussed by Tang and Xing [2001].

Criticism can also be directed at the definition of measurement scales [Grabner-Kräuter and Kaluscha 2003]. We used scales that have only been successfully applied in studies of Internet-only retailing. The scales included relatively few items per construct due to the retailer's request to keep our survey as short as possible. Though the results returned good values for Cronbach's Alpha, scaling demands more attention in further studies. Also, it remains in doubt whether our findings can be adopted for English-speaking countries, as our questionnaire was completely in German and targeted German customers only.

The study analyzed cross-channel effects between Internet and physical stores. Future work should analyze the effect of an Internet presence on trust in physical stores. Moreover, the integration of further "media channels" (mail, television) and "institutional channels" (call center, sales force) would be an interesting aspect of further work.

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## APPENDIX

Table I: Scales (in italic), items, their factor loadings and sources.

Scale and Items	Factor Loadings	Source
<i>Willingness to Buy</i>		
WTB1. How likely is it that you would consider purchasing from this e-shop in the short term?	0.88	[Heijden, Verhagen and Creemers 2001, based on , Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000]
WTB2. How likely is it that you would consider purchasing from this e-shop in the long term?	0.85	
WTB33. For this purchase, how likely is it that you buy from this e-shop?	0.69	
<i>Perceived Physical Store Size</i>		
PS1. This retailer's stores are spread all over the country.	0.91	Modified items according to [Doney and Cannon 1997, Jarvenpaa, Tractinsky and Vitale 2000]
PS2. This retailer's store network is relatively small in its home market. [reverse]	0.79	
PS3. The retailers' stores belong to a large company.	0.61	
<i>Perceived Physical Store Reputation</i>		
PR1. This retailer's stores are well known.	0.80	[Doney and Cannon 1997]
PR2. This retailer's stores have a bad reputation in the market. [reverse]	0.94	
PR3. This retailer's stores have a good reputation.	0.88	
<i>Store Trustworthiness</i>		
TR1. This e-shop is trustworthy.	-0.52	[Doney and Cannon 1997, Heijden, Verhagen and Creemers 2001, Jarvenpaa 1999, Jarvenpaa,
TR2. This e-shop keeps its commitments and promises.	-0.58	

TR3. The experiences with this e-shop met my expectations.	-0.76	Tractinsky and Vitale 2000, Koufaris and Hampton-Sosa 2002, Pavlou 2003]
<i>Perceived Privacy</i>		
PRI1. I have no concerns transmitting personal data to this e-shop.	0.90	
PRI2. This e-shop handles my personal data in a responsible way.	0.93	[Chellappa 2001]
PRI3. My personal data are in good hands at this e-shop.	0.89	
<i>Perceived Risk</i>		
RP1. What is the likelihood of you making a good bargain by buying from this store through the Internet? (very unlikely – very likely)	0.69	[Jarvenpaa 1999, Jarvenpaa, Tractinsky and Vitale 2000, Sitkin and Weingart 1995]
RP2. How would you characterize the decision to buy a product through this website? (high potential for loss – high potential for gain) [reverse]	0.84	
RP3. How would you characterize the risk to purchase at this e-shop? (very low risk, very high risk) [reverse]	0.71	

Table II: Pattern matrix of the rotated six factor solution

Item	Component					
	1	2	3	4	5	6
WTB1		0,88				
WTB2		0,85				
WTB3		0,69				
PS1				0,91		
PS2				0,79		
PS3				0,61		
PR1	0,80					
PR2	0,94					
PR3	0,88					
TR1						-0,52
TR2						-0,58
TR3						-0,76
PRI1			0,90			
PRI2			0,93			
PRI3			0,89			
RP1					0,69	
RP2					0,84	
RP3					0,71	

Note. Extraction Method: Principal Component Analysis, Rotation Method: Oblimin with Kaiser Normalization.  
Loadings below |.5| are omitted.